

IN THE CLAIMS:

Please AMEND the claims and ADD new claims as indicated below:

1. (CURRENTLY AMENDED) A method comprising:

inputting a signal light to an optical regenerator;

shaping a waveform of an input the input signal light by the optical regenerator to thereby produce output a shaped output-signal light; and

selecting a quality measure that obtains a quality measurement of said output signal light from one of:

a Q factor;

a bit error rate;

a spectrum shape; and

an eye opening; and

controlling the a power level of said input the signal light input to the optical regenerator so that said a quality measurement of the signal light output by the optical regenerator is improved, the quality measurement being one of a Q factor, a bit error rate, a spectrum shape and an eye opening to an optimal level.

2. (CURRENTLY AMENDED) A method according to claim 1, wherein said controlling comprises

optically amplifying the signal light with an optical amplifier before being input to the optical regenerator, and providing an optical amplifier amplifying said input signal light, and

adjusting the gain of said the optical amplifier to thereby control the power level of the signal light input to the optical regenerator.

7. (CURRENTLY AMENDED) A device comprising:

an a-waveform shaper optical regenerator inputting a signal light and shaping a waveform of an the input signal light to thereby produce output a shaped output-signal light; and
a quality selection module that obtains a quality measurement of said output signal light from one of:

a Q factor;

a bit error rate;

a spectrum shape; and

~~an eye opening; and~~

a power controller controlling ~~the~~ a power level of said input the signal light before the signal light is input to the optical regenerator so that ~~said a~~ quality measurement of the signal light output by the optical regenerator is improved, to an optimal level the quality measurement being one of a Q factor, a bit error rate, a spectrum shape and an eye opening.

8. (CURRENTLY AMENDED) A device according to claim 7, wherein said power controller comprises an optical amplifier amplifying ~~said input~~ the signal light before being input to the optical regenerator, and a controller adjusting ~~the gain of said the~~ optical amplifier ~~so that said quality measurement to thereby control the power level of the signal light is most improved to the optimal level.~~

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9. (CURRENTLY AMENDED) A device according to claim 7, wherein said power controller comprises an optical amplifier amplifying ~~said input~~ the signal light before being input to the optical regenerator, an optical attenuator attenuating the amplified signal light before being input to the optical regenerator ~~an output from said optical amplifier~~, and a controller adjusting ~~the attenuation of said the~~ optical attenuator ~~so that said quality measurement is most improved to the optimal level~~ to thereby control the power level of the signal light.

10. (CURRENTLY AMENDED) A method comprising:
providing ~~a waveform shaper~~ an optical regenerator having a variable threshold for waveform shaping input signal light according to said variable threshold and thereby outputting waveform output shaped signal light;
measuring ~~the~~ quality of said output signal light; and
controlling said variable threshold in accordance with the measured quality so that ~~said the measured quality measure is improved.~~

11. (WITHDRAWN - CURRENTLY AMENDED) A method according to claim 10, wherein:
said ~~waveform shaper~~ optical regenerator comprises a semiconductor optical amplifier;
and
said controlling step ~~comprises the step of~~ adjusting an injection current to be supplied to said semiconductor optical amplifier.

12. (WITHDRAWN - CURRENTLY AMENDED) A method according to claim 10, wherein:

said ~~waveform-shaper~~optical regenerator comprises a distributed feedback laser diode adapted to change said variable threshold according to the power of assist light supplied thereto; and

said controlling step comprises ~~the step of~~ adjusting the power of said assist light.

13. (CURRENTLY AMENDED) A device comprising:

an optical regenerator~~a waveform-shaper~~ having a variable threshold for waveform shaping input signal light according to said variable threshold and outputting output signal light; means for measuring the quality of said output signal light; and

a controller ~~for~~ controlling said variable threshold in accordance with the measured quality so that ~~said the measured quality measured~~ is improved.

14. (WITHDRAWN - CURRENTLY AMENDED) A device according to claim 13, wherein:

said ~~waveform-shaper~~optical regenerator comprises a semiconductor optical amplifier; and

said controller adjusts an injection current to be supplied to said semiconductor optical amplifier.

15. (WITHDRAWN - CURRENTLY AMENDED) A device according to claim 13, wherein:

said ~~waveform-shaper~~optical regenerator comprises a distributed feedback laser diode adapted to change said variable threshold according to the power of assist light supplied thereto, and a light source for outputting said assist light; and

said controller adjusts the power of said assist light.

16. (CURRENTLY AMENDED) The method of claim 1, wherein the ~~input-signal~~ light is a wavelength division multiplexed signal.

17. (CURRENTLY AMENDED) A method comprising:

inputting signal light to an optical regenerator;
shaping a waveform of an input the input signal light by the optical regenerator to thereby
produce output a shaped output-signal light;
measuring a Q factor of said output signal light; and
controlling ~~the a power level of said input the~~ signal light input to the optical regenerator
in accordance with the measured Q factor to optimize-improve the measured Q factor.

18. (CURRENTLY AMENDED) A method comprising:

inputting a signal light to an optical regenerator;
shaping a waveform of an input the input signal light by the optical regenerator to thereby
produce output a shaped output-signal light;
measuring a bit error rate of said output signal light; and
controlling ~~the a power level of said the~~ input signal light in accordance with the
measured bit error rate to optimize-improve the measured bit error rate.

19. (CURRENTLY AMENDED) A method comprising:

inputting signal light to an optical regenerator;
shaping a waveform of an the input signal light by the optical regenerator to thereby
produce output a shaped output-signal light;
measuring a spectrum shape of said output signal light; and
controlling the power of said input signal light in accordance with the measured
spectrum shape to optimize-improve the measured spectrum shape.

20. (CURRENTLY AMENDED) A method comprising:

inputting a signal light to an optical regenerator;
shaping of waveform of the input signal light by the optical regenerator to thereby
producing output a shaped output-signal from an input signal light;
measuring an eye opening of said output signal light; and
controlling ~~the a power level of said input signal light~~ in accordance with the measured
eye opening to optimize-improve the measured eye opening.

21. (CURRENTLY AMENDED) An optical repeater comprising:
an amplifier that amplifies a first signal to produce a second signal;
an attenuator that attenuates the second signal to produce a third signal;
an optical regenerator that shapes a waveform of the third signal to produce a fourth signal;
a quality monitor that measures a quality of the fourth signal; and
a controller that controls the attenuator to change a power level of the second signal in accordance with the measured quality and to thereby optimize-improve the measured quality of the fourth signal, wherein the first, second, third and fourth signals are optical signals.

22. (CURRENTLY AMENDED) A device comprising:
means for amplifying a first signal to produce a second signal;
means for attenuating the second signal to produce a third signal;
means for shaping a waveform of the third signal by an optical regenerator to produce a fourth signal;
means for monitoring a quality of the fourth signal; and
means for controlling the attenuation by said means for attenuating in accordance with the monitored quality to change a power level of the second signal and thereby optimize improve the monitored quality measure of the fourth signal, wherein the first, second, third and fourth signals are optical signals.

23. (CURRENTLY AMENDED) An apparatus comprising:
an optical regenerator means for inputting a signal light and shaping a waveform of an
the input signal light to thereby output produce a shaped output signal light;
means for measuring a Q factor of said output signal light; and
means for controlling the a power level of said input signal light in accordance with the measured Q factor to optimize-improve the measured Q factor.

24. (CURRENTLY AMENDED) An apparatus comprising:
an optical regenerator inputting a signal light and means for shaping a waveform of an
the input signal light to thereby produce output a shaped output signal light;
means for measuring a bit error rate of said output signal light; and
means for controlling the a power level of said input signal light in accordance with the

measured bit error rate to optimize-improve the measured bit error rate.

25. (CURRENTLY AMENDED) ~~An apparatusA method~~ comprising:
an optical regenerator inputting a signal light and means for shaping a waveform of an
the input signal light to thereby produce-output a shaped output-signal light;
means for measuring a spectrum shape of said output signal light; and
means for controlling ~~the-a~~ power level of said input signal light in accordance with the
measured spectrum shape to optimize-improve the measured spectrum shape.

26. (CURRENTLY AMENDED) ~~An apparatusA method~~ comprising:
an optical regenerator inputting a signal light and shaping a waveform of the input signal
light to thereby outputmeans for producing a shaped output-signal light from an input-signal
light;
means for measuring an eye opening of said output signal light; and
means for controlling ~~the-a~~ power level of said input signal light in accordance with the
measured eye opening to optimize-improve the measured eye opening.

27. (CURRENTLY AMENDED) A method as in claim 1, wherein said controlling
comprises:
controlling gain of an optical amplifier which amplifies the input signal light, to thereby
control the power level of the input signal light.

28. (CURRENTLY AMENDED) A method as in claim 17, wherein said controlling
comprises:
controlling gain of an optical amplifier which amplifies the input signal light, to thereby
control the power level of the input signal light.

29. (CURRENTLY AMENDED) A method as in claim 18, wherein said controlling
comprises:
controlling gain of an optical amplifier which amplifies the input signal light, to thereby
control the power level of the input signal light.

30. (CURRENTLY AMENDED) A method as in claim 19, wherein said controlling
comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control the power level of the input signal light.

31. (CURRENTLY AMENDED) A method as in claim 20, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control the power level of the input signal light.

32. (NEW) A method according to claim 1, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

33. (NEW) A device according to claim 7, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

34. (NEW) A method according to claim 17, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

35. (NEW) A method according to claim 18, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

36. (NEW) A method according to claim 19, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

37. (NEW) A method according to claim 20, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

38. (NEW) An optical repeater according to claim 21, wherein the optical

regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

39. (NEW) A device according to claim 22, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

40. (NEW) An apparatus according to claim 23, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

41. (NEW) An apparatus according to claim 24, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

42. (NEW) An apparatus according to claim 25, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

43. (NEW) An apparatus according to claim 26, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.
